IN THE CLAIMS

1. (Amended) A method of forming an optical component, comprising:

forming a mask over a light transmitting medium so as to protect a region of the light transmitting region where a waveguide is to be formed; and

applying an etching medium to the light transmitting medium so as to form one or more waveguide surfaces with a smoothness less than 220 nm, the etching medium including a fluorine containing gas and one or more partial passivants selected from the group consisting of SiF_4, C_4F_8, CH_2F_2 and CHF_3.

2. The method of claim 1, wherein the fluorine containing gas includes SF_6 and the partial passivant includes CHF_3.

3. The method of claim 1, wherein the fluorine containing gas includes SF_6 and the partial passivant includes C_4F_8.

4. The method of claim 1, where the etching medium excludes oxygen.

5. The method of claim 1, wherein the fluorine containing gas is selected from a group consisting of SF_6, Si_2F_6 and NF_3.

6. (Amended) The method of claim 1, wherein the partial passivant is selected from a group consisting of C_4F_8 and CHF_3.

7. The method of claim 1, wherein the one or more surfaces includes a sidewall of the waveguide.

8. The method of claim 1, wherein the one or more surfaces include a waveguide facet.

9. The method of claim 1, wherein the etching medium is applied at a pressure of 1 mTorr to 600 mTorr.

10. The method of claim 1, wherein the etching medium is applied at a pressure of 1 mTorr to 60 mTorr.

11. The method of claim 1, wherein the etching medium is applied at a pressure of 10 mTorr to 30 mTorr.

12. The method of claim 1, wherein the etching medium includes one or more other media.

13. The method of claim 1, wherein the one or more other media is selected from the group consisting of SiF_4 and SiF_6

14. The method of claim 1, wherein the one or more other media include a noble gas.

15. The method of claim 1, wherein the etching medium has a molar ratio of partial passivant to fluorine containing gas of 0.1:1 to 100:1.

16. The method of claim 1, wherein the etching medium has a molar ratio of partial passivant to fluorine containing gas of .5:1 to 10:1.

17. The method of claim 1, wherein the etching medium has a molar ratio of partial passivant to fluorine containing gas of 1:1 to 2:1.

18. The method of claim 1, wherein the mask is formed so as to protect a region of the light transmitting region where a plurality of waveguides are to be formed and the etching medium is applied to as to form one or more surfaces on at least one of the waveguides.

19. The method of claim 1, wherein the mask is an oxide mask.

20. The method of claim 1, wherein the mask is a photoresist.

21. The method of claim 1, wherein the etching medium is applied in an inductively coupled plasma etch.

22. (Amended) A method of forming an optical component, comprising:

obtaining an optical component having a light transmitting medium positioned over a base; and

applying an etching medium to the light transmitting medium so as to form one or more waveguide surfaces with a smoothness less than 220 nm, the etching medium including one or more partial passivants and a fluorine containing gas selected from a group consisting of Si_2F_6 and NF_3.

23. (Amended) The method of claim 22, wherein the partial passivant includes CHF_3.

24. (Amended) The method of claim 22, wherein the partial passivant includes C_4F_8.

25. The method of claim 22, where the etching medium excludes oxygen.

26. (Amended) The method of claim 22, wherein the fluorine containing gas includes NF_3.

27. The method of claim 22, wherein the partial passivant is selected from a group consisting of HBr, SiF_4, C_4F_8, CH_2F_2 and CHF_3.

28. The method of claim 22, wherein obtaining the optical component includes receiving the optical component from a supplier.

29. The method of claim 22, wherein the etching medium is applied at a pressure of 1 mTorr to 200 mTorr.

30. The method of claim 22, wherein the etching medium is applied at a pressure of , 5 mTorr to 60 mTorr.

31. The method of claim 22, wherein the etching medium includes a second fluorine containing gas selected from the group consisting of SiF_4 and SiF_6.

32. The method of claim 22, wherein the etching medium also includes a noble gas.

33. The method of claim 22, wherein the etching medium has a molar ratio of partial passivant to fluorine containing gas less than 100:1.

34. The method of claim 22, wherein the etching medium has a molar ratio of partial passivant to fluorine containing gas of about .5:1 to 10:1.

35. The method of claim 22, wherein the etching medium has a molar ratio of partial passivant to fluorine containing gas of about 1:1 to 2:1.

36. The method of claim 22, wherein the mask is formed so as to protect a region of the light transmitting region where a plurality of waveguides are to be formed and the etching medium is applied to as to form one or more surfaces on at least one of the waveguides.

37. The method of claim 22, wherein the etching medium is applied so as to form at least one surface on a plurality of waveguides.

38. The method of claim 22, wherein the etching medium consists of only SF6 as the fluorine containing gas, CHF_3 as the partial passivant and Oxygen.

39. The method of claim 22, wherein the etching medium is applied in an inductively coupled plasma etch.

REMARKS

Paragraph [0004] is amended to specify that "the Bosch method typically provides a roughness of about 220 nm." This quote is extracted from page 3, lines 9-12 of U.S. Patent